

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claims 1-14. (Cancelled).

Claim 15. (Currently Amended): A method of producing a solid carbonaceous product C_xH_y , wherein x and y are the average number of carbon and hydrogen atoms respectively and the ratio of x:y is greater than 2.5:1, comprising: wherein heating a hydrocarbon fuel comprising bulk feedstock fuel and flame fuel is heated in the presence of oxygen with oxygen at a C:O stoichiometric ratio greater than 1:0.4, to a temperature of at least about 1000°C, to thereby effect incomplete combustion and partial pyrolytic decomposition of said hydrocarbon fuel, and so as to produce a said solid carbonaceous product C_xH_y , wherein said solid carbonaceous product has a C:H stoichiometric ratio of greater than 2.5:1.

Claim 16. (Currently Amended): The method of as claimed in Claim 15, wherein said the value of x in the x:y ratio C:H stoichiometric ratio exceeds 40:1.

Claim 17. (Currently Amended): The method of as claimed in Claim 15, wherein said method comprises: at least the steps of pre-heating said the bulk feedstock fuel, and passing said bulk feedstock fuel into a reactor, wherein in which said bulk feedstock fuel is rapidly heated to a temperature of between about 1000 and 2000°C for between 0.1 and 10 seconds by interspersing said bulk feedstock fuel with air or oxygen-assisted hydrocarbon flames generated by reaction of utilizing said flame fuel with oxygen or air, to obtain localized heating and to thereby effect partial pyrolytic decomposition.

Claim 18. (Currently Amended): The method of as claimed in Claim 17, wherein said hydrocarbon flames are generated by reaction of the flame fuel with oxygen are oxygen-assisted.

Claim 19. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein said bulk feedstock fuel and said flame fuel are the same or different, and wherein said temperature of at least about 1000°C is achieved by combustion of the flame fuel which is mixed with, or separate to, the bulk feedstock fuel.

Claim 20. (Currently Amended): The method ~~of as claimed in~~ Claim 19, wherein said bulk feedstock fuel and said flame fuel are the same or different and are mixed together, and wherein said temperature of at least about 1000°C is achieved by ignition of the hydrocarbon fuel causing localized combustion of ~~said the~~ flame fuel within said bulk feedstock fuel.

Claim 21. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein the combustion products are interspersed with ~~said the~~ feedstock fuel by the use of turbulence.

Claim 22. (Currently Amended): The method ~~of as claimed in~~ Claim 21, wherein said turbulence is achieved by introducing one or more of ~~at the~~ flame, combustion products, flame gas, oxidizer, hydrocarbon fuel or feedstock fuel into ~~at the~~ reactor at a velocity of 20-200m/s.

Claim 23. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein ~~said the~~ feedstock fuel comprises ~~is comprised of~~ one or more gaseous hydrocarbons.

Claim 24. (Currently Amended): The method ~~as of claimed in~~ Claim 15, wherein ~~said the~~ feedstock fuel is natural gas.

Claim 25. (Currently Amended): The solid carbonaceous product obtainable by the method ~~of described in~~ Claim 15.

Claim 26. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein a hydrogen-rich gas with a H:C stoichiometric ratio equal to or exceeding 20:1, and a H:O stoichiometric ratio greater or equal to 5:1 is produced.

Claim 27. (Currently Amended): A~~The~~ method of combustion comprising, combusting ~~wherein~~ the hydrogen-rich gas produced according to the method of Claim 26 ~~is~~ combusted.

Amendment under 37 C.F.R. § 1.111
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Claim 28. (Cancelled)

Claim 29. (Currently Amended): The method ~~of as claimed in~~ Claim 15, wherein said hydrocarbon fuel is heated in the presence of ~~with~~ oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.

Claim 30. (Currently Amended): The method ~~of as claimed in~~ Claim 26, wherein said hydrocarbon fuel is heated in the presence of ~~with~~ oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.